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- Descriptive title of the Invention - Cross References to Related Applications - Statement Regarding Fed sponsored R & D - Reference to Microfiche Appendix - Background of the Invention - Brief Summary of the Invention - Brief Description of the Drawings (if filed) - Detailed Description - Claim(s) - Abstract of the Disclosure			a. <input type="checkbox"/> Computer Readable Copy b. <input type="checkbox"/> Paper Copy (identical to computer copy) c. <input type="checkbox"/> Statement verifying identity of above copies		
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b. <input checked="" type="checkbox"/> Copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with box 17 completed) [Note Box 5 below]			10. <input type="checkbox"/> English Translation Document (if applicable)		
i. <input type="checkbox"/> <u>DELETION OF INVENTOR(S)</u> Signed statement attached deleting inventor(s) named in the prior application, See 37 CFR 1.63(d)(2) and 1.33(b)			11. <input type="checkbox"/> Information Disclosure Statement (IDS)/PTO-1449 <input type="checkbox"/> Copies of IDS Citations		
5. <input type="checkbox"/> Incorporation By Reference (usable if Box 4b is checked) The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.			12. <input checked="" type="checkbox"/> Preliminary Amendment		
			13. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503)		
			14. <input type="checkbox"/> Small Entity Statement <input type="checkbox"/> Statement filed in prior application, Status till proper and desired		
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17. If a CONTINUING APPLICATION , check appropriate box and supply the requisite information: <input checked="" type="checkbox"/> Continuation <input type="checkbox"/> Divisional <input type="checkbox"/> Continuation-in-part (CIP) of prior application No.: 08/741,121					
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CITI0035 - CON

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the U.S. Application of

Michael L. GRANDCOLAS et al.

Group Art Unit: 2773 (Anticipated)

U.S. Serial No.: Continuation of 08/741,121 Examiner: Huynh, B. (Anticipated)

Filed: Filed Herewith

For: METHOD AND SYSTEM FOR AUTOMATICALLY HARMONIZING ACCESS TO
A SOFTWARE APPLICATION PROGRAM VIA DIFFERENT ACCESS DEVICES

Box Patent Application

Assistant Commissioner For Patents

Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to calculating the filing fee and examination, please amend the above-identified application as follows.

IN THE SPECIFICATION

Page 1, line 6 please insert the following --This application is a continuation of U.S. Application 08/741,121--.

Page 2, line 9 please change "thus" to --Thus--;

line 25 please change "is readable ad" to --should be readable and--; and

line 28 please change "ad" to --and--.

Page 3, line 17 please change "needs" to --is needed--.

IN THE CLAIMS

Please cancel claims 1-13. Please add new claims 14-21.

14. A method of interfacing a plurality of different access devices to either a legacy application or a canonical application comprising;

parsing a data stream from the desired application if the desired application is a legacy application;

creating a token representation of the data stream from the desired application, regardless if the application is a legacy application or a canonical application; and

forwarding the token representation to one of the plurality of access devices.

15. The method of claim 14 further comprising:

displaying the data stream on the one access device.

16. The method of claim 14 wherein the one access device is a home computer.

17. The method of claim 14 wherein the one access device is personal digital assistant.

18. The method of claim 14 wherein the one access device is a screenphone.

19. A system for distributing information to a plurality of customers comprising:
an application for providing data in response to a request for data;
a token creator-mapper for creating a first token representation of the data provided by the application and a second token representation of the data provided by the application; and
a plurality of different access devices for each of the plurality of customers wherein a first access device receives the first token representation of the data and the second access device receives the second token representation.

20. The system of claim 19 wherein the first token representation and the second token representation of data include data specific to one customer.

21. The system of claim 19 wherein the first token representation and the second token representation of data include data generic to the plurality of customers.

By the above amendments, claims 1-13 have been cancelled and claims 14-21 have been added. Therefore, claims 14-21 are pending.

Serial No. Filed Herewith
Docket No. CITI0035 - CON

An issuance of a Notice of Allowance is earnestly solicited. However, should the Examiner determine that any further action is necessary to place this application into better form, he is encouraged to telephone applicants' undersigned representative at the number listed below.

Respectfully submitted,

Michael L. GRANDCOLAS et al.

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GTM/bdd/T0091.094251/CITI0035- CON/52726

METHOD AND SYSTEM FOR AUTOMATICALLY HARMONIZING
ACCESS TO A SOFTWARE APPLICATION PROGRAM VIA DIFFERENT
ACCESS DEVICES

5

BACKGROUND OF THE INFORMATION

Successful financial institutions recognize that their customers may wish to perform financial transactions, such as accessing their accounts, through a variety of different ways and at different times. For example, while in the past customers were required to visit their bank branches during office hours to make transactions, today sophisticated banks make their services available electronically on a 24-hour basis. A number of different electronic devices exist to access one's bank account to perform transactions, including an automated teller machine ("ATM"), a personal computer at a work or home location, a web browser on the internet or a screen phone. As technologies develop, other electronic mechanisms to access financial services will become available. The ability of financial institutions, including banks, to accommodate the ever-expanding host of access devices is an increasingly important part of getting and maintaining customers.

A major problem faced by a financial institution in accommodating the various access devices is assuring that the computer software program (also called "applications") made available to customers by the bank are compatible with the various devices used by the customers. For example, the protocols used to display information on an ATM may be different than the protocols used to display that information through a web browser on a user's personal computer. There may be

different communications protocols for the displays of the devices and different encoding standards of the data, once the data gets to the display device.

Traditionally, applications have been written so that they very tightly "couple" the sequence of the application with the actual encoding of the presentation of that application. Thus, new devices with different encoding standards and protocols have required that the application programs be rewritten.

Traditionally, financial institutions have responded to this problem by writing different versions of the same computer application, with each variation being compatible to a particular access device. thus, one version of a bill-paying program is written to be compatible with an ATM, another version of the same program is written to be compatible with a personal computer and yet another version of the same program is written to be compatible with a web browser on the internet.

Writing, maintaining and updating these different versions is expensive and time-consuming. Accordingly, there is a need for a system which makes a single version of an application program compatible with a number of different access devices.

An example of compatibility is making sure that all of the information to be displayed to the user is, in fact, displayed on the screen of the device being used. For example, when a relatively small screen display device is used, such as screens on screenphones, there may not be a great deal of space to display to the user the information and prompts required to run the program (for example, name of payee for bill payment, address of payee, etc.). In such an instance, abbreviations of phrases and the positioning of the icons, prompts and other information on the screen is readable ad intelligible by the user. Where larger screens are involved, such as personal computer screens or television screens, there is more space and in such an instance, larger phrasing and greater spacing between icons, prompts, ad other information is desirable. Thus, there is a need for a method and system to identify the type of screen being used and automatically customize the information to be displayed to the particular screen.

Further, because many banking programs were written some time ago, the devices originally intended for use with these programs may no longer be manufactured, due to replacement of the old devices with new devices. In such instances, the financial institution may be required to rewrite the application in order to use it at all on new devices. This is expensive and time-consuming. Accordingly, there is a need to make existing programs automatically compatible with new access devices.

SUMMARY OF THE INVENTION

10 These and other objects of the invention are achieved by the method and system described below. Specifically, the method and system described automatically harmonizes access to a given software application program via different access devices. Through use of the method and system, a financial institution can provide access to a given application (such as, for example, 15 automatic bill payment services) to customers using different access devices such as web browsers, screen phones and personal computers. A single application program is all that needs to be written and maintained by the financial institution.

Also, the method and system enables financial institutions to "leverage" existing programs because now the institution can automatically "project" its 20 existing stock of program services unto new access devices -- devices which may not have even existed at the time the program was created.

The invention achieves these objectives by receiving information from the user via the user's access device, including information identifying the type of device being used and the application program the user wishes to access. The application program is then accessed and the information to be displayed to the 25 user is identified. This information is automatically translated into a format which is compatible with the device, including its display, and sent to the device for display. The user, in turn, inputs information in response to the displayed information and this input information is automatically translated into a format 30 which is compatible with the application program and is sent to the application

program. The response generated by the application program is automatically translated to be compatible with the device and is sent to the device.

BRIEF DESCRIPTION OF THE DRAWINGS

- 5 Figure 1 depicts an overview of the present invention.
- Figure 2 depicts a detailed architectural overview of the present invention.
- Figure 3 depicts a representation of the present invention on computer monitor.
- Figure 4 depicts a second representation of the present invention on a
- 10 computer monitor.
- Figure 5 depicts a hierarchy of a template selection.
- Figure 6 depicts a chart of the hierarchy for combination of token attributes.
- Figures 7, 8, 9, 10 and 11 depict charts of the encoding tokens and token
- 15 attributes.
- Figure 12 depicts an diagrammatic layout of the present invention.
- Figure 13 depicts the decision choices executed by the template hierarchy of Figure 5.
- Figure 14 depicts an image of the present invention as may appear on a
- 20 computer monitor.
- Figure 15 depicts a second image of the present invention as may appear o a computer monitor.

DETAILED DESCRIPTION

- 25 Figure 1 depicts an overview of the present invention. As shown, the present invention includes a communication medium 12 providing the means for a plurality of customer devices 10 to communicate with a financial institution and its software applications 14. The various types of customer devices include but are not limited to solitary or networked Macintosh, DOS and Windows based personal
- 30 and laptop computers; voice and screen telephones; and personal digital assistants.

Figure 2 depicts a detailed architectural view of the present invention. A financial institution software application 23, 27 receives an initial communication from a customer's computer device 20. The initial communication will contain at a minimum customer identifying information including the customer device's language, business and device type. The application 23, 27 produces an application stream in response to the initial communication. Depending upon the nature of the application or application tools used, there are many potential forms of the application stream, including a Legacy application stream and a canonical token application stream.

10 A Legacy application stream contains data without any tokens. In order to be processed by a token-creator-mapper into a desired format for the customer's device, the application stream needs to contain tokens. A token or tag is a single element of an encoding language. For example, a token could be an input field, check box, or a choice. As used by the present invention, a token is an element of the electronic communication language used between the financial institution's application software and the token creator mapper. Therefore, by adding a token representation to an application stream en route to a customer, one is ensured that the application stream will be in a form comprehensible by the customer's computer system.

20 Where the financial institution Legacy application 23 puts forward a Legacy application stream, the stream is directed towards a parser 21. The parser 21 reads the Legacy application, determines that no token representation exists, and then adds a token representation or tokenizes the Legacy application stream. The now tokenized application stream is directed to the token-creator-mapper 26 along connecting line 29.

25 When the financial institution application puts forward a canonical token application stream 27, the stream by definition already contains a token representation and is no longer in need of the parser 21. The canonical token application stream is directed along connecting line 29 to the token-creator-mapper 26.

The present invention interfaces with a variety of financial institution applications that put forward a variety of application streams. Therefore, a variety of token-creator-mappers can be employed to map tokens within the variety of application streams. For purposes of illustration, a single token-creator-mapper is represented, although it is understood that a variety of token-creator-mappers can be used by the skilled artisan in place of the single element. All token-creator-mappers output a token stream that will be particular to a renderer used by the customer's device. Renderers are software components within computer systems that create two-dimensional representations of inputted token streams.

The token-creator-mapper 26 receives a tokenized application stream. The token-creator-mapper maps the application stream into a token representation that is understood by the customer device's renderer 22. The process of mapping is the transformation from one set to another or the making of a logical connection between two entities. Mapping is the process by which a first set of concepts is translated into a second set of concepts through a series of layers. Each layer contains the same amount of information as the layer above, but in a form somewhat closer to the form of the second concept. Eventually, after a series of layers, the first concept is translated into the second concept.

The particular renderer type and the appropriate token representation that is understood by the particular renderer is stored in a template data file 28. The template does not perform any processing, rather the template is referenced by the token-creator-mapper 26 during the process wherein the token-creator-mapper creates a token stream representation of the inputted application stream. The template is a data file that includes descriptions, lists of named tokens classified according to renderer type, and the style with which the application stream is to be presented on the customer device's monitor. In addition to use of a single template, the present invention may take advantage of a plurality of templates as may be envisioned by the skilled artisan. For purposes of illustration, one template is depicted. The template 28 allows the user of the present invention to modify the monitor screen layout of a financial institution application without actually altering the application or customer's device. The template 28 is

5 The second column of buttons 56 includes three buttons. From top to bottom, a first button 63 is an inquiry into borrowing money. Button 63 includes symbol 69 of two people shaking hands thereon and the phrase "Borrow" 79 thereunder. A second middle button 65 is an inquiry into financial credit. Button 65 includes a symbol 71 of a star thereon and phrase "Credit" 73 thereunder. A third button 67 is an inquiry into a financial sum. Button 67 includes a "+" and "=" symbol 75 thereon and the phrase "Sum" 77 thereunder.

10 Between the first and second columns is positioned box 58. Box 58 contains a list of items that may be selected by the customer. The items are depicted as phrases and include the following: "Add a Payee", 72; "Change a Payee", 68; and "Cancel a Payee", 70. The phrases may be scrolled by repositioning box 66 within column 64. The box may be repositioned by the customer using the computer keyboard, mouse, and the like.

15 The above screen layouts are accomplished by providing device-specific templates and minor content changes to edit icons. Certain customer devices have very limited screen space, resulting in the need to express phrases in short, concise structures. To provide numerous syntactic and format versions of a phrase, phrase packs are used.

20 Phrase packs may be used to label buttons, icons or portions of the monitor screen. For example, the phrase "Your Money in the Bank" may be resolved through a phrase dictionary (discussed below) or related mechanism to appear in a tokenized application stream as follows:

<BTN1 PP.L=Your Money in the Bank, PP.S=Money>

25 wherein, BTN1 refers to a first button, PP.L refers to a long phrase and PP.S refers to a shortened version of the same phrase. The selection of which phrase to appear at a particular location on a designated monitor screen is a result of the control of the token-creator-mapper, device-specific template, and device-specific renderer. Phrase packs, like other elements located within the template data file, allow the user to alter the appearance of items on the monitor screen without
30 altering the financial institution program or customer device. Phrase packs include a hierarchy that allow the user to select a language, style, business,

device, and modal flexibility by manipulation of an appropriate level of the hierarchy. This hierarchy is set out in Figure 5.

The phrase packs include a hierarchy of importance 84 regarding functions and forms of the phrase. The hierarchy is depicted in Figure 5, ranging in importance from top to bottom. At the top of the hierarchy is the phrase itself 85. For example, as discussed above, the phrase may include, "Your Money in the Bank". The second level in the hierarchy is the language of the phrase 86. It is the intent of the present invention to reach as many people, in as many languages as possible, hence the language of the phrase is limited only by the design limitations of the skilled artisan. Therefore, the language of the phrase receives a high priority in the template hierarchy.

The third level of the hierarchy 87 is directed towards the identity of the financial institution application that the customer has selected to make use of. The identity of the financial institution application will dictate the tonality of the phrase to be presented to the customer.

The fourth level in the hierarchy of importance in the template data selection process is the computer monitor and support 88. This consideration will determine placement of icons, as well as the selection of long or short phrase packs from the template.

The following three considerations concern the length of the phrase: long form 89; medium form 90; and short form 91. The length of the phrase is determined by the type of renderer associated with a particular monitor screen type. The final two considerations include the actual presentation to the customer of the application. The eighth level 92 of the hierarchy is a consideration of the iconic form assigned and positioned on the computer monitor. The final consideration 93 is the voice form of a phrase pack or the like, as may be presented by the customer. After satisfying the levels of the hierarchy, an appropriate phrase pack satisfying the monitor screen real estate and display format (typed on a screen or spoken) will be selected either by manipulation of a remote agent or automatic function of the present invention.

The main menu of the screen as presented to the customer on the customer's monitor is a product of the application front end. The structure of the application front end is independent of the financial institution application and therefore can be modified to the particular needs of a financial institution allowing two different financial institutions to tailor the same application to their needs. The application front end is the location wherein specific icons and other menu items can be injected to tailor the application output presentation. All messages between the application and customer travel through the application front end. The application front end also allows for manipulation of functions of the applications including the paying of bills, transferring of monies and other tasks set upon the financial institution application. The architecture of the present invention with the inclusion of the application front end is depicted in Figure 6.

Figure 6 depicts a detailed view of an architecture of the present invention 100. As shown by the figure from top to bottom, components of a financial institution application are set out in a top row 102. Row 102 contains four examples of numerous available application functions, including from left to right the following: a "Pay Bill" function 101; a "Transfer of Funds" function 103; a "Buy Stock" function 105; and a "Balance Inquiry" function 107. Functions within row 102 are in electrical connection with an application front end 106 as depicted by connecting lines 104.

The application front end 106 creates an application stream as will be discussed below with regard to Figure 7. The application stream is directed along connecting line 108 to token-creator-mapper 109. The token-creator-mapper 109 operates as discussed above and directs the resulting token stream along connecting line 110 to a device renderer 111.

The device renderer 111 operates as discussed above and directs a screen image along connecting line 112 to the device monitor screen 113. Displayed on the device monitor screen 113 is the rendered token stream of the text appearing below.

1. <SCR T=A>

2. <TXT ID=T1 PP.L="What would you like to do?" >
3. <BTN ID=BA V=A PP.L="Add a Payee" >
4. <BTN ID=BB V=B PP.L="Change a Payee" >
5. <BTN ID=BC V=C PP.L="Cancel a Payee" >
- 5 6. <BTN ID=B1 V=1 PP.L="Your Money in the Bank",
PP.S="Money" >
7. <BTN ID=B2 V=2 PP.L="Borrowing and Loans",
PP.S="Borrow" >
8. <BTN ID=B3 V=3 PP.L="Credit Cards", PP.S="Credit" >
- 10 9. <BTN ID=B4 V=4 PP.L="Summary and Services",
PP.S="Sum" >
10. <BTN ID=B5 V=5 PP.L="Quotes" >
11. <BTN ID=B6 V=6 PP.L="Exit" >

- 15 Line numbers have been added for purposes of discussion only and are not part of the tokenized text. Line 1 refers to a token designation wherein the initials "SCR" is the key word of the token for a template name and "T=A" refers to the template labeled "A" used to format the appearance of the screen. Line 2 includes the initials "TXT" referring to the token for text on the screen 113. The identity
- 20 of the text is set out by the initials "ID=" with the name of the text being "T1". The identification is followed by a long phrase pack. The result of line 2 is shown by element 118 of Figure 6. Lines 3 through 11 consist of four sets of token attributes and their assigned values. The first set of attributes define the nature of the insertion onto the customer's computer monitor including text phrase packs,
- 25 icons, buttons or the like. The second set of attributes identifies the insertion. The second set is signified by the term "ID=" followed by some signifying indicia. The third set of attributes defines the value expected by the application to invoke selection of the identified option. The third set is identified by the attribute "V=" followed by a return value, such as an alphabetic or numeric option choice
- 30 identifier. The fourth set of attributes sets out the phrase pack to be inserted. As detailed above, the phrase pack may be in a longer form, as is signified by the

attribute "PP.L=" followed by the long phrase or set of words in quotes. The short form of the phrase pack is set out as "PP.S=" followed by the short phrase or set of words in quotes. Where the two forms are set out in one line, the two lengths of phrase packs are separated by a comma.

- 5 Line 3 assigns button bar 120 to the customer's screen as signified by the first set of attributes, "BTN". The button is identified by the label "BA" as indicated by the second set of attributes. The button will return the selection value of "A" to the application and includes long phrase pack, "Add a Payee" 121. Likewise, lines 4 and 5 refer to button bars 122 and 124, located directly below
10 button 120, which read "Change a Payee" 123 and "Cancel a Payee" 125, respectively.

- Lines 6 through 10 refer to a row of buttons 127 positioned along the top perimeter of the screen 113. Row 127 includes five buttons as indicated by the first variable of lines 6 through 10 reading "BTN". The buttons are identified by
15 the second set of variables of "ID=B1; B2; B3; B4; B5", respectively. The application's expected selection values of the five buttons are indicated by the attribute "V=1; 2; 3; 4; 5", respectively. As depicted, first button 128 displays a short phrase pack "Money" 129; second button 130 displays short phrase pack "Borrow" 131; third button 132 displays the short phrase pack "Credit" 133;
20 fourth button 134 displays short phrase pack "Sum" 135; and fifth button 136 displays short phrase pack "Quotes" 137. Finally, line 11 refers to exit button 126. When arranging the layout of the computer screen 113, the device renderer 111 in conjunction with a tokenized application stream uses elements found missing within the template to select and place items.

- 25 A closer examination of the interaction between the applications and the application front end follows. The examination will focus on the operation of the application front end with respect to receipt of a Legacy (no tokens) application and a Direct Access (canonical tokens) application.

- As depicted in Figure 7, both Direct Access application 140 and Legacy
30 application 142 direct their respective application streams along connecting lines 141 and 143, respectively, to the application front end 144. The application front

end is divided into the following four parts: main menu services 145, stream monitor 146, phrase pack dictionary 147, and data store 148.

The Direct Access application stream supports several logical channels within it. One logical channel supports screen related output and customer related input. Other logical channels support such functions as uploading of scripts, downloading of customer information, bitmaps and templates. When the Direct Access application first receives customer identification information, the stream monitor component of the Direct Access application uses the identifying information to select appropriate top level menu components and phrases from the phrase packs dictionary.

The stream monitor 146 controls the functions of the application front end 144, including the functions of interpreting, normalizing and enhancing all input and output data streams. All input and output data streams pass through the stream monitor.

Different portions of a data stream are intended for different destinations, including messages to the customer's device, messages to the integrator, an application switch, a request for main menu services, references to the phrase pack dictionary and messages to the data store.

Messages to the customer's device are subject to editing by the stream monitor to include or exclude tokens related to the style of presentation including non-linear navigation (omnipresent menu buttons) and product-specific function and icon requirements. When the stream monitor detects the presence of a Legacy application, the stream monitor converts the Legacy application stream into a Direct Access application stream.

Messages to the integrator facilitate the integration process wherein a combination of diverse elements of hardware and software are put into a unified system. The presence of an application switch in an application stream passes control of the application stream to an appropriate financial institution software application function. In addition, omnipresent menus elections, activity codes and remote scripts or agents can trigger an application switch.

Omnipresent menu selections are menu selections that are available to the user throughout any portion of use of an application. In contrast, top level main menu selections are selections available to the user of an application only from a specific screen function, usually a top screen main menu. Examples of top level
5 main menu services or functions include balance inquiries and transfer of funds.

The main menu services 145 are traversed when an appropriate section is received, until the selection triggers an application switch. Then the application switch "engages" the appropriate application function required for the selection made.

10 The phrase pack dictionary 147 supports multiple languages and language forms to supply requests for phrase packs. Composed as a database, the phrase pack dictionary requires at least the following primary data elements to locate the form of a given phrase: (in hierarchical order) language; business; and device type. In operation, the selection from the phrase pack dictionary takes the route
15 depicted in Figure 8.

An example of a phrase pack selection 150 is set out in Figure 8. As depicted, the phrase pack dictionary first receives a request 152 for language type 154. In this example, the request was for a phrase pack in English 153 as opposed to French 155 via connecting lines 151. Next, the phrase pack receives a request
20 for a format of a specific bank type presentation 156. The presentation includes the bank logo, special format and functional features, and other distinguishing screen features. As depicted, the example selection was for bank one 159 over bank two 161. This second step of the selection process is depicted by connected lines 157. The third query presented to the request for a phrase pack is type of
25 customer device 158. As depicted, the selection is between a screen phone 165 and a personal computer 167. The third choice query is depicted by connecting lines 163. The example phrase pack request selected a personal computer as the means by which the phrase pack is to be presented to the user. Finally, the phrase pack request is to select the form 162, via connecting lines 169, of the phrase pack
30 which includes the following: typed on a screen in long form 171; short form 173; presented as spoken word(s) 175; or presented in icon form 177. The phrase

For example, as shown in the matrix on Figure 10, a SCREEN token may contain a single WINDOW MENU BAR and possibly any of the other token types (GROUP, TEXT FIELD, TABLE, LIST, BUTTON, or IMAGE). That single WINDOW MENU BAR may itself contain one or more WINDOW MENU

5 tokens, which then may contain one or more WINDOW MENU ITEMS. In addition to a token such as the menu bar, a TEXT FIELD token item may be included within the SCREEN token. This TEXT FIELD token could be a statement or paragraph of directions that needs to be presented to the user. A token, such as a TEXT FIELD, may have its display presentation modified by a

10 token item like CENTER, which would attempt to present the contents of the TEXT FIELD token in a centered position on the customer's rendering device. These tokens, when combined in the matrix's allowed groupings, will be used to create the application token stream that will represent the user interface to be generated on the customer's rendering device.

15 Token attributes are set out in Figures 11 - 15. Token attributes are the computer language elements referring to the location, content, and style of icons, buttons and other elements that appear on the computer monitor screen. These figures include a chart depicting elements that may appear on a computer monitor screen along with locating tags. The locating tags tell the computer where on the

20 screen to place the respective screen element. The charts of Figures 11 - 15 include the following headings of columns: a first column devoted to listing the attributes and tags; a second column labeled "Template"; a third column labeled "Stream"; a fourth column labeled "Full Tag"; a fifth column labeled "Abbreviation"; a sixth column labeled "Default"; a seventh column labeled

25 "Terminated"; and an eighth column labeled "Notes".

The first column sets out the bulk of the attributes and tags addressed by templates utilized by the present invention. The second column sets out the location of the attribute as being within the template. The third column sets out the location of the attribute as being within a stream. The second and third

30 column are not necessarily mutually exclusive. The fourth column sets out the actual language of the element and tag as may appear in the template or stream.

00000000 " 00000000
The language is intended to be in a form that is comprehensible by computers in use with the present invention. The language instructs the computers where to place elements on screens. The fifth column sets out abbreviations for language set out in the fourth column. The sixth column sets out defaults automatically assigned to values within the actual language if operation of the token attributes does not assign a selected value. The selected value will vary according to the application in use and requirements of the customer. The seventh column sets out the actual language employed to terminate the element assigning language. The eighth column sets out any pertinent notes as may be needed in employing the language set out in the respective row.

The elements addressed by the token attributes include the following: Table Headers, Table Data, Table Rows, Lists, Lists Items, Buttons, Virtual Terminal Windows, Images, Inputs, Status Bars, Forced Line Breaks, Center, Left, Right, Money Format, and Highlight. The use of these tokens and corresponding attributes provides the ability to create a definition of the user interface to be presented to the customer. This defined stream is what will be translated by the token-creator-mapper 26 into a token stream that can be understood by the renderer 22 to display a usable application interface. The displayed interface is therefore generated without the need for the originating financial application to be aware of the customer's device-specific display requirements.

Figures 16 and 17 depict images as may actually appear on a computer monitor. Both images include selections for applications that may be activated by the customer. Figure 16 spaces such selections across the top of the computer monitor screen in a row of buttons, followed by text, then a list of payees to select from. The screen also includes an escape button on the lower right-hand corner of the screen. The selection of payees can be tailored to the individual client's payees and may be selected by a computer mouse, as well as labeling letters. In contrast, Figure 17 depicts a screen having 7 buttons with descriptive text therein and above and below the buttons. The buttons may be activated by a mouse, as

WHAT IS CLAIMED IS:

1 1. A method for facilitating communication between a user using a device
2 with a display and an application program affiliated with a financial institution
3 which the user desires to access through the device comprising the steps of:
4 receiving information from said device;
5 identifying the desired program and the type of device being used;
6 accessing the desired application program, identifying information to be
7 displayed to the user as part of the program and translating the information to be
8 displayed into a format which is compatible with the display of the device;
9 translating input information inputted by the user in response to the
10 displayed information into a format which is compatible with the application
11 program and forwarding said translated input information to said application
12 program; and
13 translating a response to the input information returned by said program
14 into a format which is compatible with the display of said device and forwarding
15 said translated said response to said device.

1 2. The method of claim 1 wherein said step of identifying the type of
2 device being used further includes the step of identifying the type of software
3 being used by the device.

1 3. The method of claim 1 wherein said step of identifying the type of
2 device being used further includes the step of identifying the type of software
3 being used by the device.

1 4. The method of claim 1 wherein said step of translating the information
2 to be displayed includes the step of automatically determining how to position the
3 information onto the screen so that all the information is displayed.

1 5. The method of claim 4 wherein said information includes one or more
2 token from the group of prompts, icons, buttons, wording, phrasing, phrase packs,
3 scroll bars, tool bars and scroll lists.

1 6. The method of claim 1 wherein said step of translating the information
2 to be displayed on the device further includes the step of translating the
3 information into a tokenized language which is compatible with both the device
4 and the application program.

1 7. The method of claim 6 wherein the step of translating the information
2 into a tokenized language further includes the steps of:
3 applying a token hierarchy to the information; and
4 creating a token representation of said information, which is compatible
5 with the device.

1 8. The method of claim 7 wherein said creating step further includes the
2 step of consulting a table of token attributes.

1 9. The method of claim 1 wherein said application program involves a
2 financial service.

1 10. The method of claim 9 wherein said financial service is bill payment.

1 11. The method of claim 9 wherein said financial service is transferring
2 funds between accounts.

1 12. The method of claim 9 wherein said financial service is buying
2 securities.

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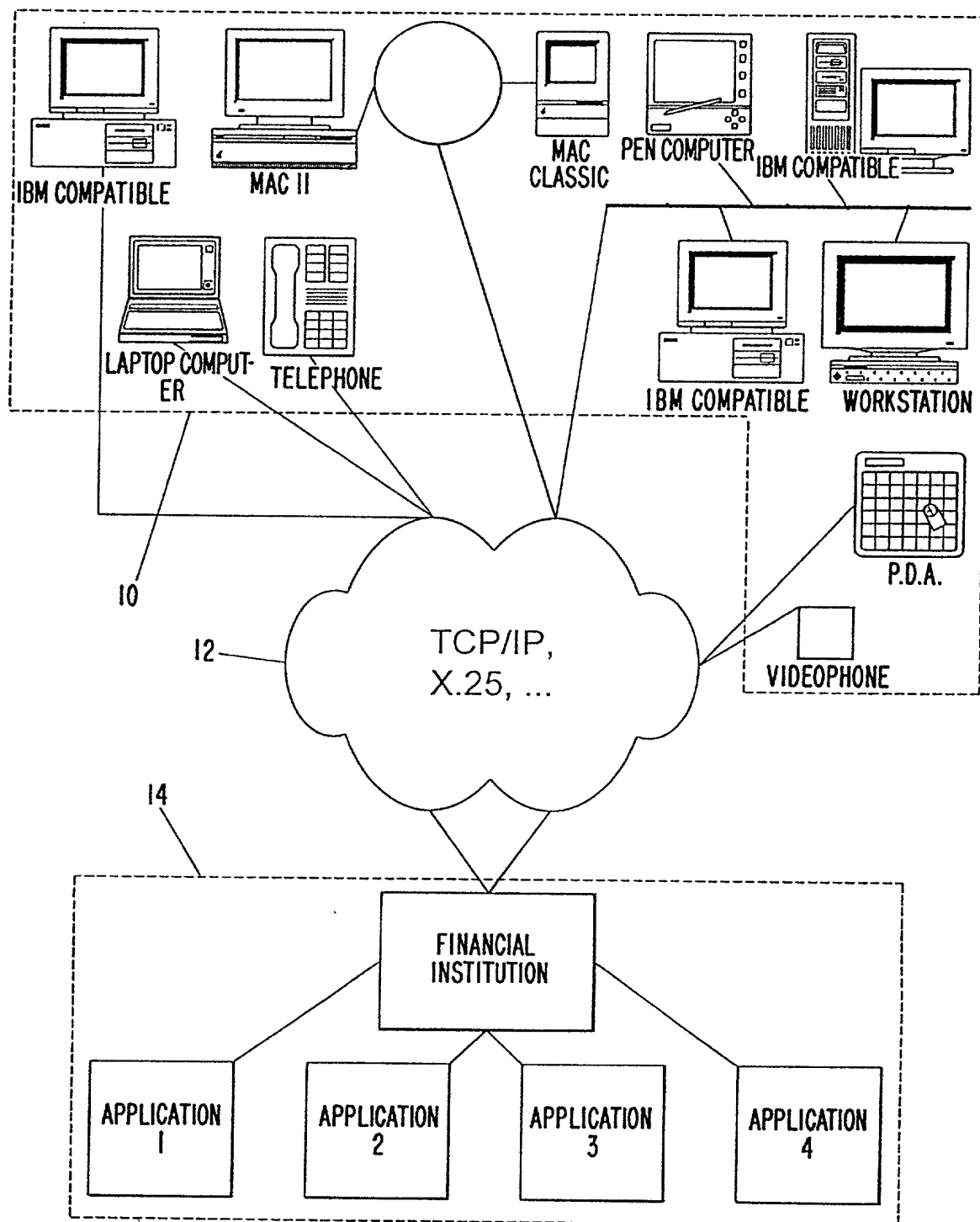
1 13. A method or enabling a plurality of different access devices each
2 having a display to access a plurality of different application programs comprising
3 the steps of:
4 identifying the type of access device and associated display and application
5 program to be accessed;
6 accessing the program and determining the type of information to be shown
7 on the display as part of the program;
8 applying a token hierarchy to the information;
9 creating a token representation of said information which is compatible
10 with said display, including the step of consulting a table of token attributes; and
11 sending the token representation to the device.

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ABSTRACT OF THE DISCLOSURE

A method and system automatically harmonizes access to a given software application program via different access devices. Through use of the method and system, a financial institution can provide access to a given application (such as, for example, automatic bill payment services) to customers using different access devices such as web browsers, screen phones and personal computers. A single application program is all that needs to be written and maintained by the financial institution. Also, the method and system enables financial institutions to “leverage” existing programs because now the institution can automatically “project” its existing stock of program services unto new access devices -- devices which may not have even existed at the time the program was created. By receiving information from the user via the user’s access device, including information identifying the type of device being used and the application program the user wishes to access, the present invention solves these problems. The application program is then accessed and the information to be displayed to the user is identified. This information is automatically translated into a format which is compatible with the device, including its display, and sent to the device for display. The user, in turn, inputs information in response to the displayed information and this input information is automatically translated into a format which is compatible with the application program and is sent to the application program. The response generated by the application program is automatically translated to be compatible with the device and is sent to the device.

FIG. 1



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FIG. 2

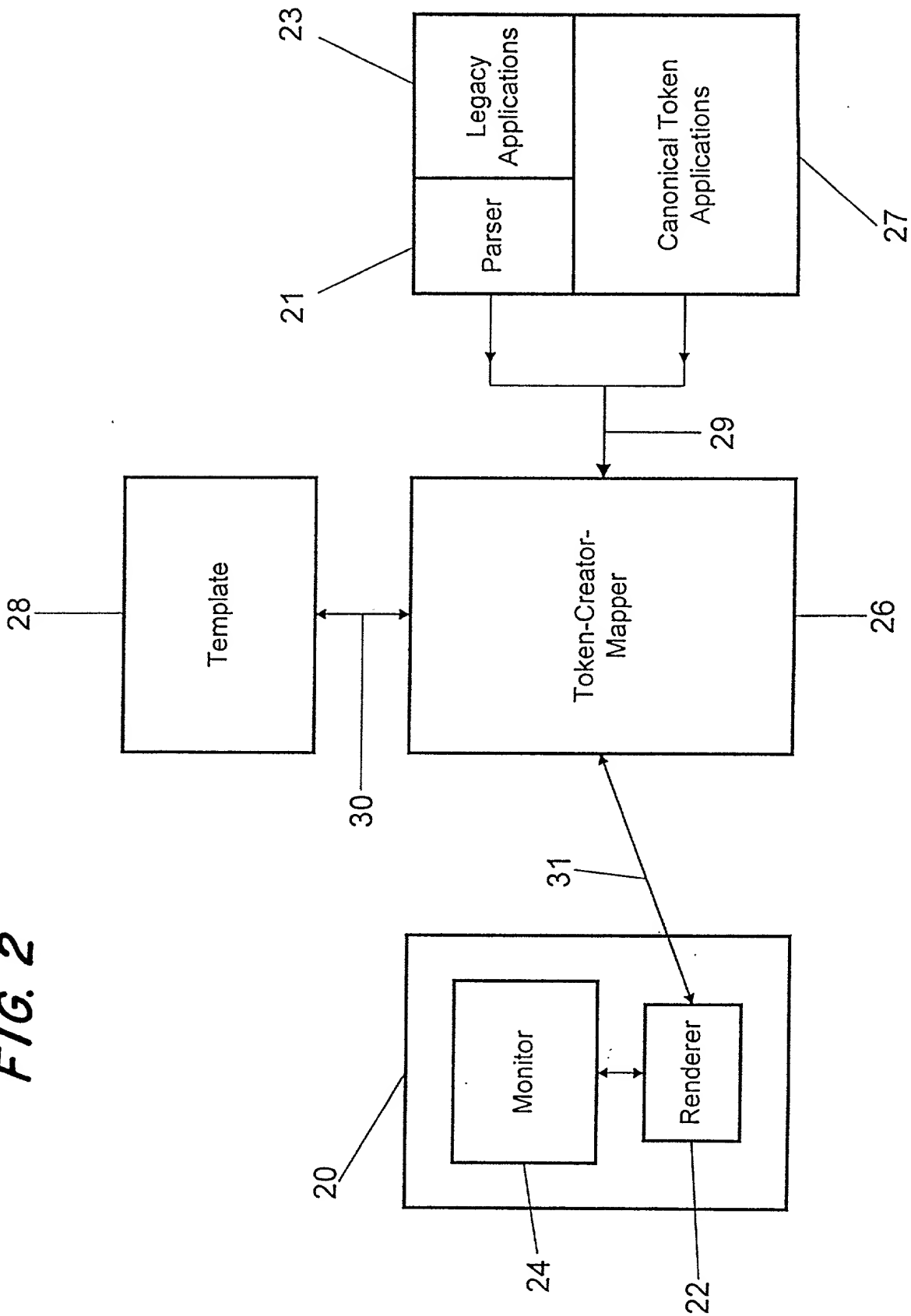


FIG. 3

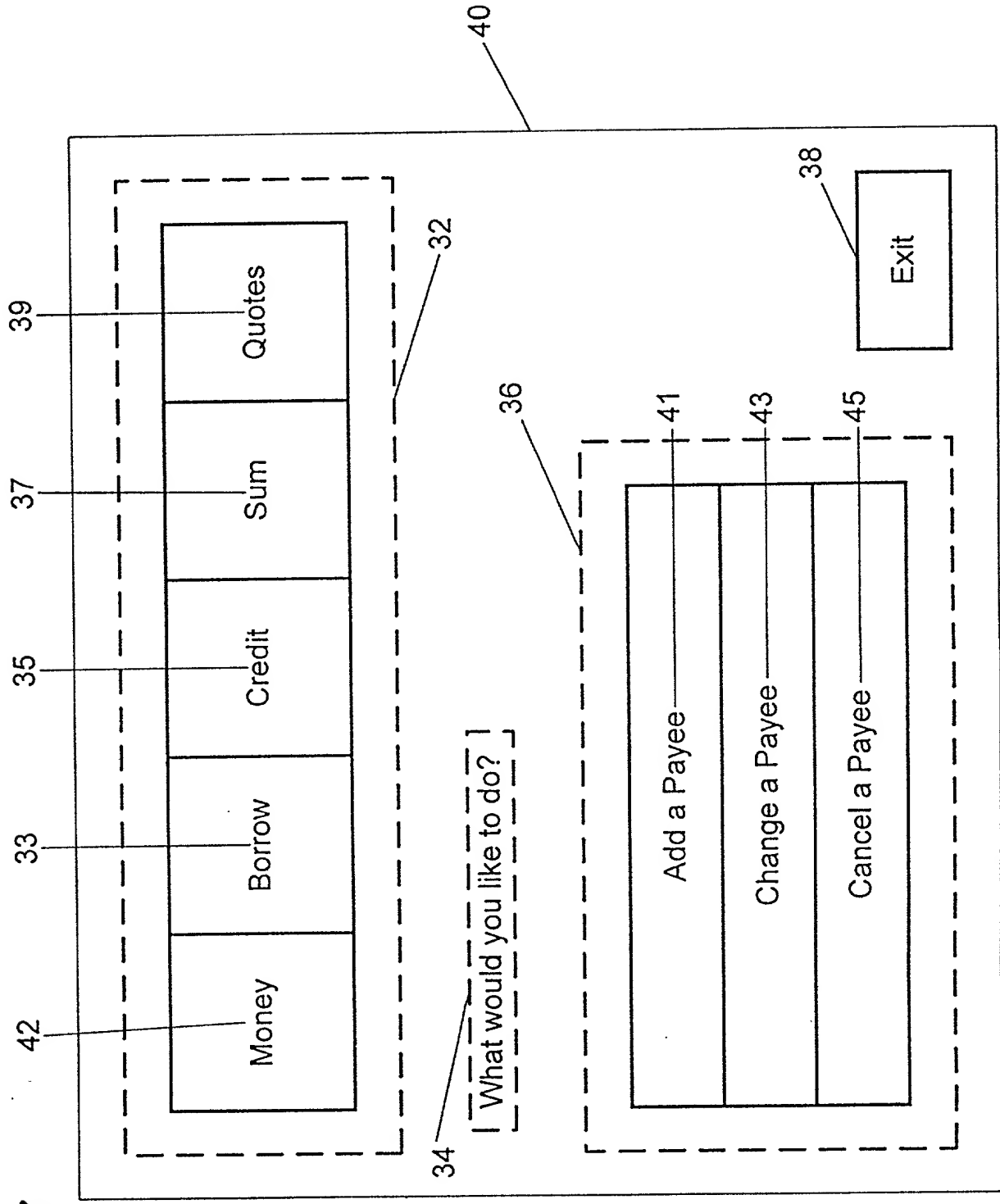


FIG. 4

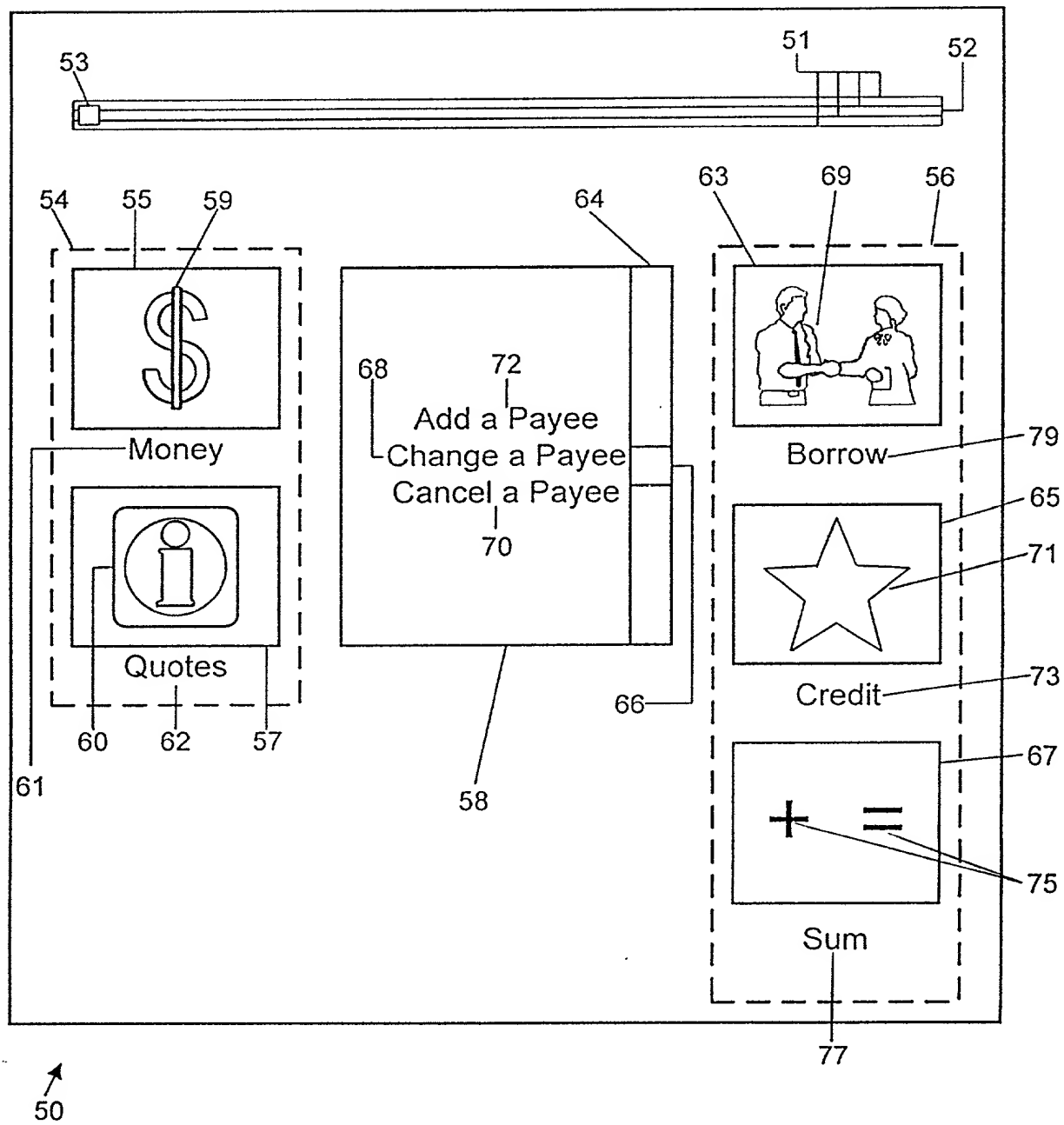


FIG. 5

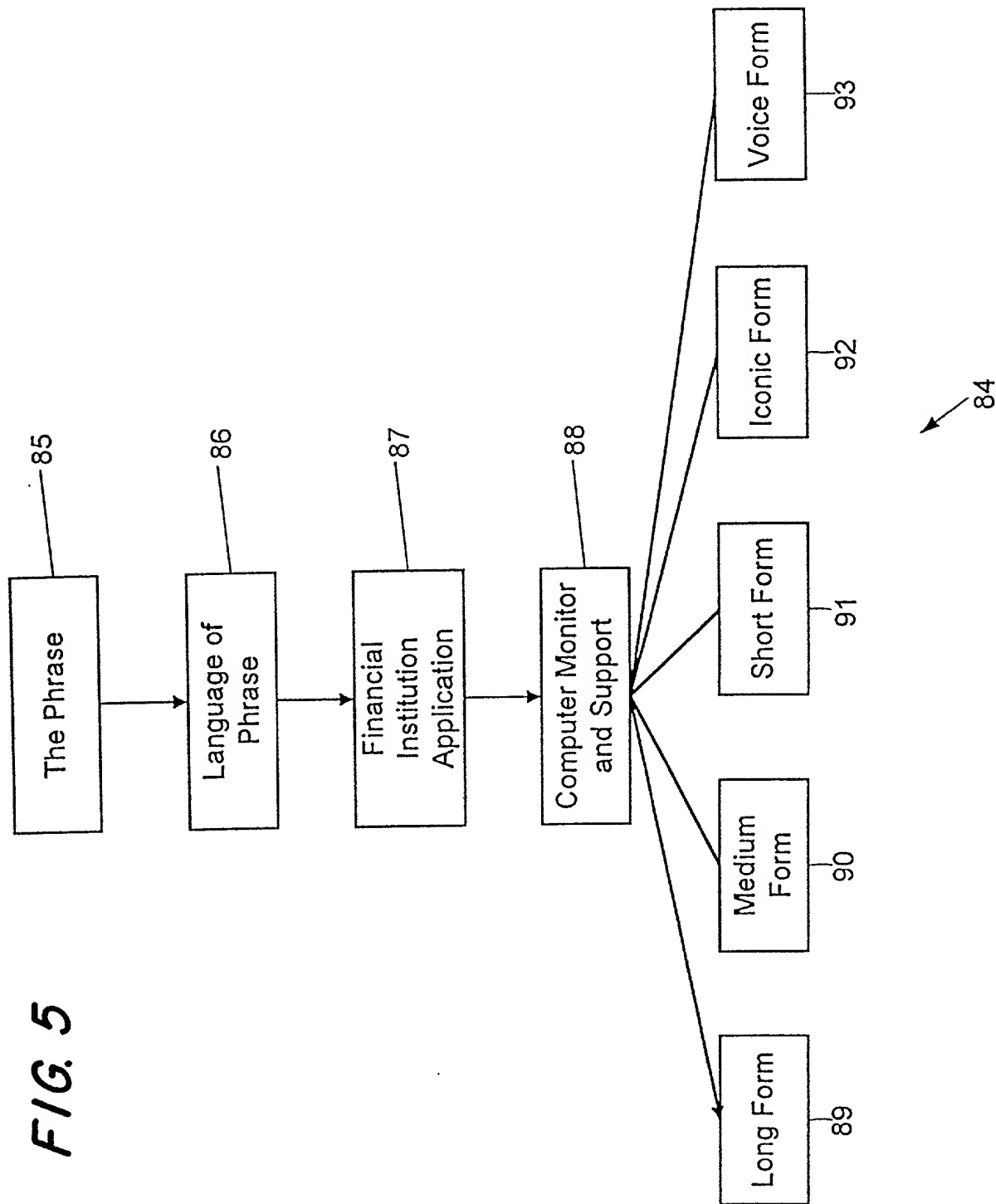


FIG. 6

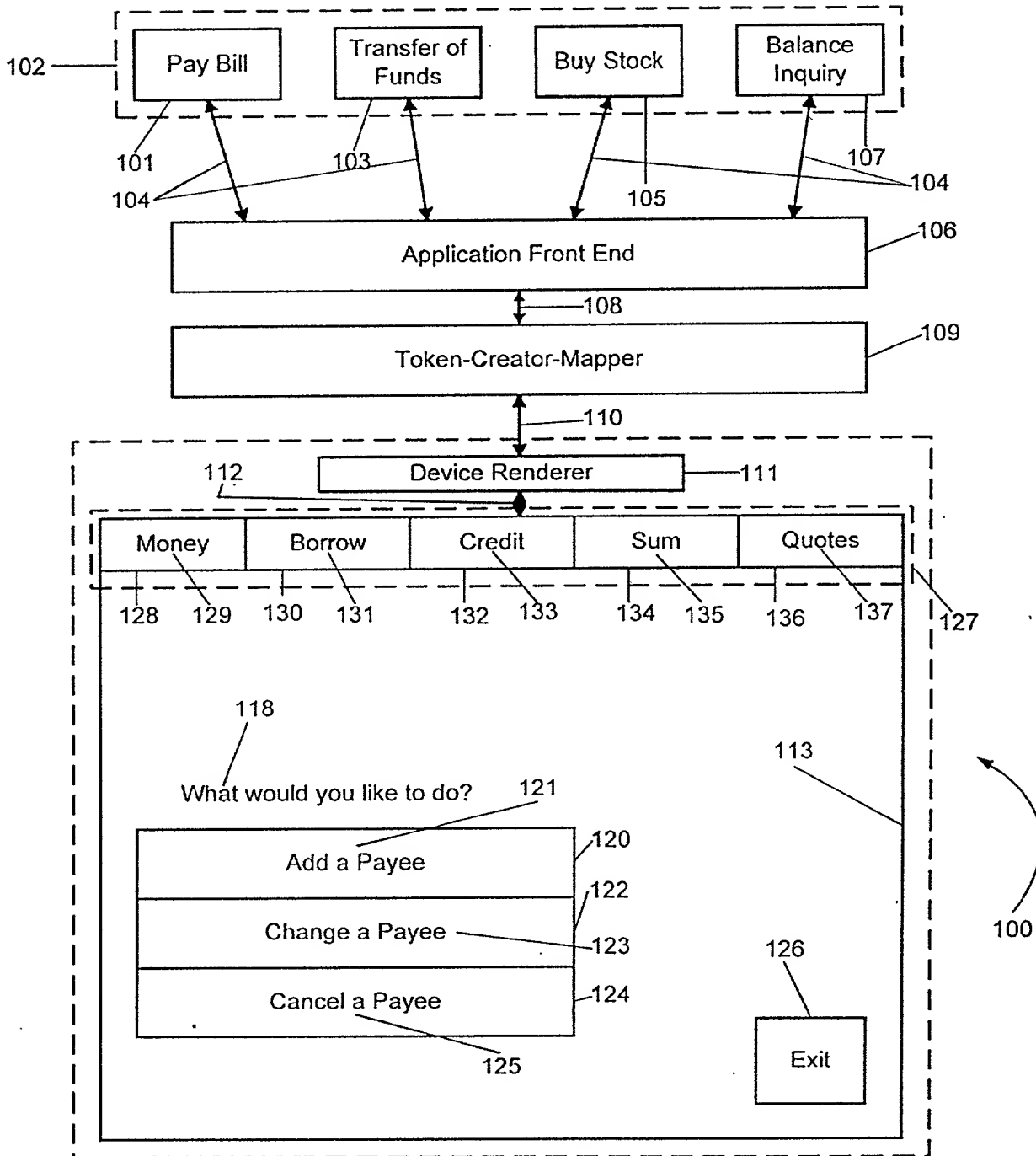


FIG. 7

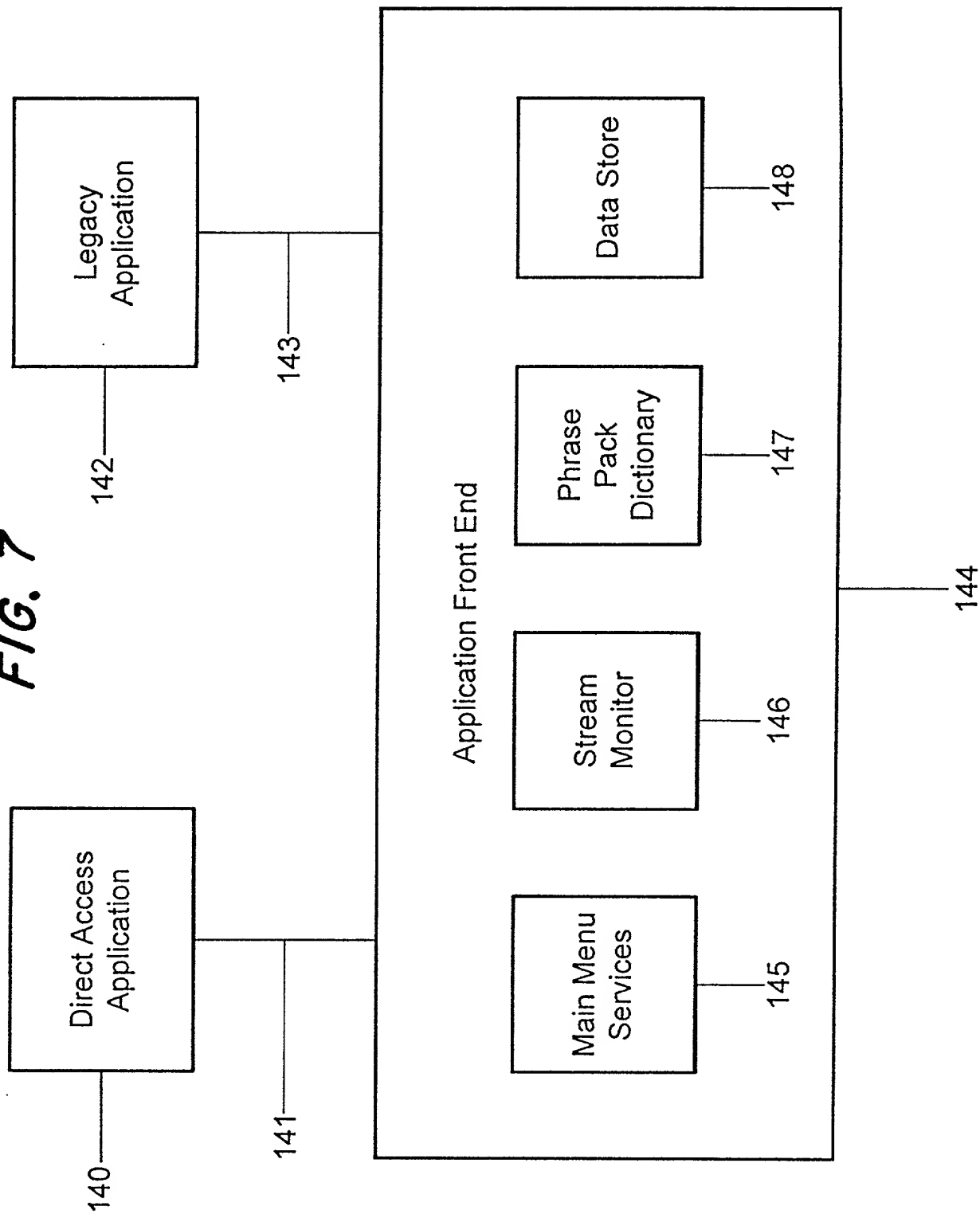


FIG. 8

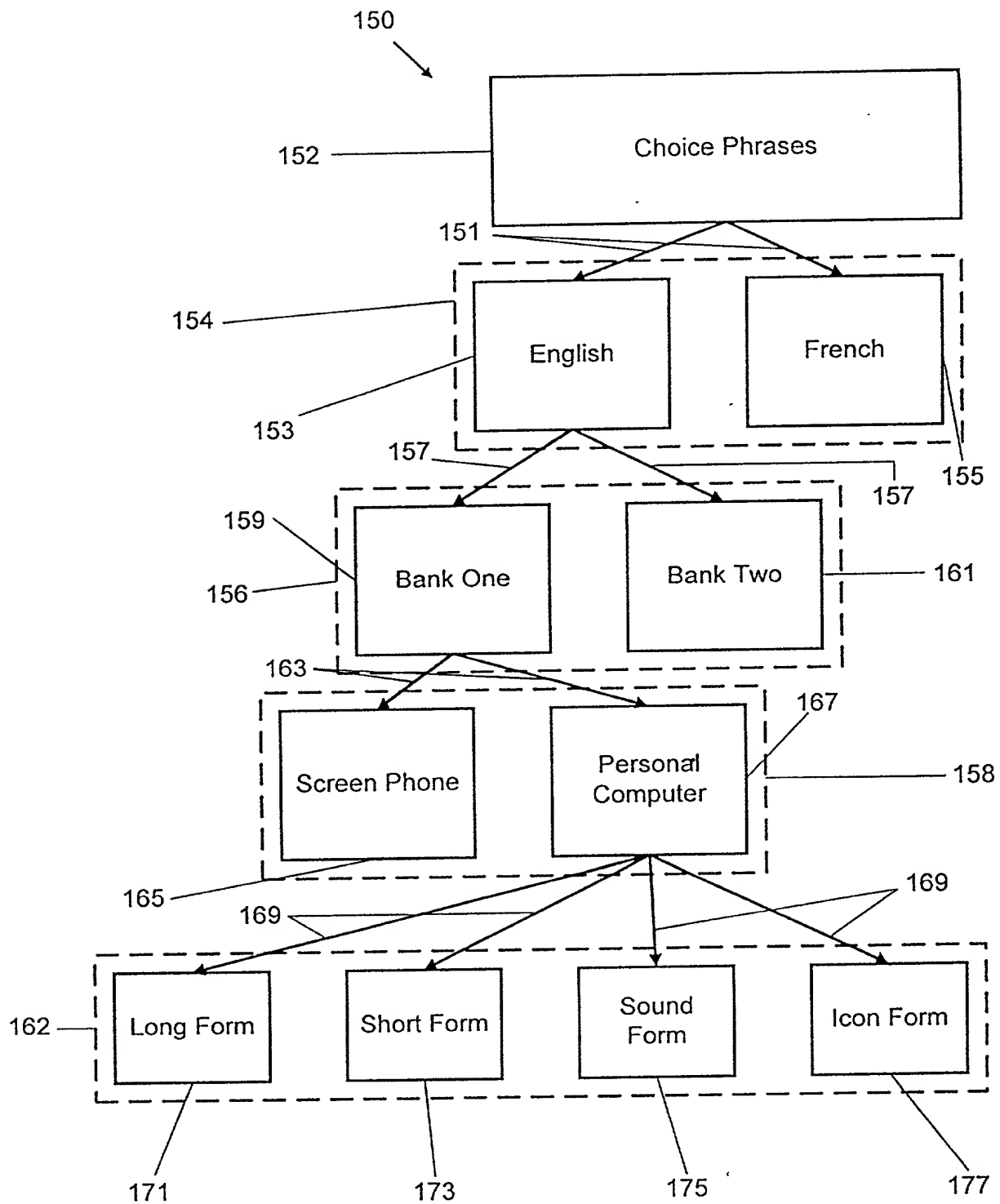
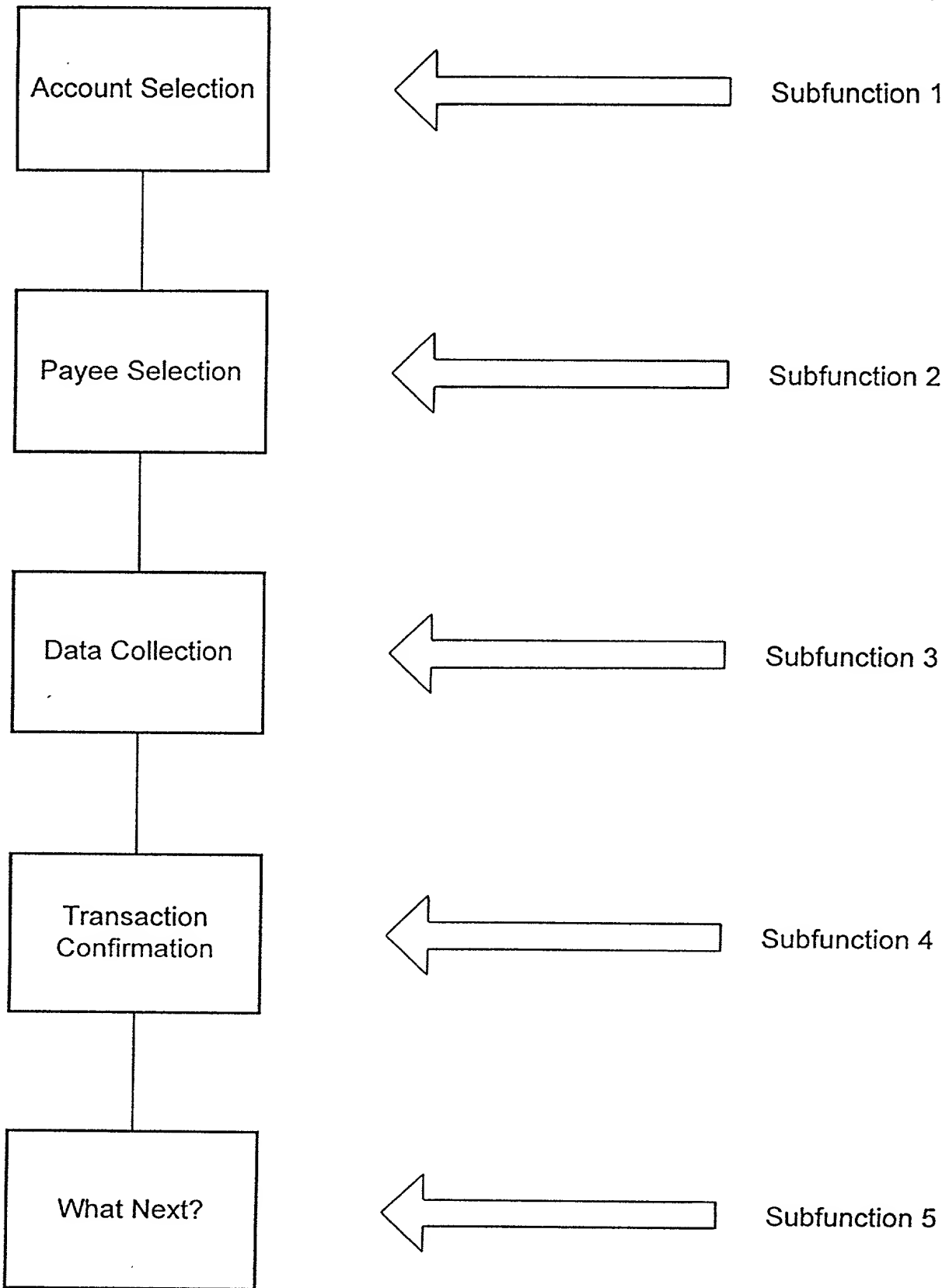


FIG. 9



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FIG. 10

TOKEN TYPE	WINDOW MENU BAR	WINDOW TITLE	WINDOW MENU	WINDOW MENU ITEM	GROUP	TEXT FIELD	TABLE HEADER ITEM	TABLE DATA ITEM	TABLE ROW DELIMITER	LIST	LIST ITEM	BUTTON	IMAGE
SCREEN	1 ONLY	1 ONLY			X	X				X		X	X
DIALOG	1 ONLY	1 ONLY			X	X				X		X	X
WINDOW MENU BAR			X										
WINDOW MENU			X	X									
GROUP					X	X				X		X	X
TEXT FIELD												X	X
TABLE							X	X	X				
TABLE HEADER ITEM						X						X	X
TABLE DATA ITEM						X						X	X
LIST										X	X		
LIST ITEM						X						X	X
FORCED BREAK						X		X			X	X	
CENTER						X						X	X
LEFT						X						X	X
RIGHT						X						X	X
MONEY						X						X	X
HIGHLIGHT						X						X	X

FIG. 11

TAG	ATTRIBUTE	TEMPLATE	STREAM	FULL TAG	ABBREVIATION	DEFAULT	TERMINATED	NOTES
SCREEN		X	X	< SCR...> OR <DLG...>			</SCR> OR </DLG>	DLG IS A DIALOG BOX
ID		X	X	ID = name				
BACKGROUND		X		BACKCOLOR = color	BC = color			
WINDOW TITLE		X	X	<WTITLE...>			</WTITLE>	
ID		X	X	ID = name				
MOVABLE		X		MOVE = [YN]		Y		
SIZABLE		X		SIZE = [YN]		Y		
CLOSABLE		X		CLOSE = [YN]		Y		
TITLE TEXT			X					
WINDOW MENU BAR		X	X	<WMENU...>				
ID		X	X	ID = name				
WINDOW MENU			X	<M...>			</M>	
ID			X	ID = name				
MENU TEXT			X					
WINDOW MENU ITEM			X	<MI...>			</MI>	
ID			X	ID = name				
VALUE			X	VALUE = n				
CHOICE ENABLED			X	ENABLED = [TRUE/FALSE]	EN = [TF]	T		
MENU ITEM TEXT			X					

FIG. 12

TAG		ATTRIBUTE		TEMPLATE	STREAM	FULL TAG		ABBREVIATION	DEFAULT	TERMINATED	NOTES	
GROUP				X	X	< GROUP... >					CONTAINER: WHAT ELEMENTS CAN BE CONTAINED NEEDS TO BE DEFINED	
ID			X	X	X	ID = name						
STYLE					X	STYLE = known style		ST = style			MENU BAR, BLACKBOX OR TRANSPARENT	
SIZE/POSITION			X			X = n Y = n H = n W = n						
OTHER ATTRIBUTES, BASED ON STYLE					X							
TEXT FIELD			X		X	< TXT... >				< /TXT >		
ID			X		X	ID = name						
TEXT ALIGNMENT					X	ALIGN = [LEFT, CENTER, RIGHT]		AL = [LCIR]	LEFT			
SIZE/POSITION			X			X = n Y = n H = n W = n						
FONT STYLE			X			FONT = font name		FN = font				
FONT SIZE			X			FONT SIZE = n		FS = n				
FOREGROUND COLOR			X			FORECOLOR = color		FC = color				
BACKGROUND COLOR			X			BACKCOLOR = color		BC = color				
PHRASE PACK					X	PP.LONG = text data		PP.L=text			PHRASE PACK IS A STRUCTURE CONTAINING THE VARIOUS TEXT RENDERINGS ASSOCIATED WITH THE BUTTON	
TABLE			X		X	< TABLE... >				< /TABLE >		
ID			X		X	ID = name						
SIZE/POSITION			X			X = n Y = n H = n W = n						
NUMBER OF COLUMNS					X	NUMCOLS = n		NC = n	PER DATA		IF NOT SPECIFIED, THESE ARE SET BY RENDERER	
NUMBER OF ROWS					X	NUMROWS = n		NR = n	PER DATA		IF NOT SPECIFIED, THESE ARE SET BY RENDERER	

FIG. 13

TAG	ATTRIBUTE	TEMPLATE	STREAM	FULL TAG	ABBREVIATION	DEFAULT	TERMINATED	NOTES
TABLE HEADER			X	< TH... >			<TH>, <TD>, <TR>, OR </TABLE>	HEADER INFO. (BOLD)
COLUMN SPAN			X	COLSPAN = n		1		
ROW SPAN			X	ROWSPAN = n		1		
ALIGNMENT			X	ALIGN=[LEFT CENTER RIGHT]	AL = [L C R]	CENTER		
TABLE TEXT			X					
TABLE DATA			X	< TD... >			<TH>, <TD>, <TR>, OR </TABLE>	
ROW SPAN			X	COLSPAN = n		1		
ALIGNMENT			X	ROWSPAN = n		1		
TABLE TEXT			X	ALIGN=[LEFT CENTER RIGHT]	AL = [L C R]	CENTER		
TABLE ROW			X	< TR >				TERMINATES ROW
LIST				< LIST >			</LIST>	
ID		X	X					
SIZE / POSITION		X		X = n Y = n H = n W = n				
LIST TYPE			X					
OTHER ATTRIBUTES, DEPENDENT ON TYPE								
LIST ITEM				< LI >				
VALUE			X	VALUE = val	V = x			
SELECTED			X	SELECTED = [YES NO]	SE = [Y N]	NO		
LIST ITEM PHRASE PACK			X	PP. LONG = text data	PP. L = text			LONG OR SHORT FORMS

FIG. 14

TAG		ATTRIBUTE		TEMPLATE	STREAM	FULL TAG		ABBREVIATION	DEFAULT	TERMINATED	NOTES
CHOICE				X	X	< BTN... >				< CH... >	
ID				X	X	ID = name					.
VALUE					X	VAL = character		V = char			
HOT KEY				X		HOTKEY = key		HK = char			
STYLE					X	STYLE = known style		ST = style			EXIT, CAT BUTTON, MENU BUTTON, TEXT BUTTON, ICON BUTTON...
ALIGNMENT					X	ALIGN = [LEFT CENTER RIGHT]		AL = [L C R]	LEFT		
SELECTED					X	SELECTED = [YES NO]		SE = [Y N]	NO		
ENABLED					X	ENABLED = [TRUE FALSE]		EN = [T F]	TRUE		
SIZE/POSITION				X		X = n Y = n H = n W = n					
ACTION					X	ACTION = [SUBMIT SELECT NEXT FOLD]		ACT = [SUB SEL NEXT]	SUBMIT		
BUTTON PHRASE PACK					X						
BUTTON IMAGE					X	BIMG = image file					ONLY FOR ICONBTN
ADSI SOFT KEY					X	SOFTKEY = [TRUE FALSE]		SOFT = [T F]	FALSE		CHOICE SHOULD BE MAPPED TO SOFT KEY
VIRTUAL TERMINAL WINDOW						DETAILS TBD					
ID				X	X						
TYPE/PROTOCOL				X							
SIZE/POSITION				X							
DATA					X						
IMAGE						< IMG... >					
ID				X	X	ID = name					
SIZE/POSITION				X		X = n Y = n H = n W = n					
IMAGE FILE					X	SRC = Image file					

FIG. 15

TAG	ATTRIBUTE	TEMPLATE	STREAM	FULL TAG	ABBREVIATION	DEFAULT	TERMINATED	NOTES
INPUT				< INPUT... >			< /INPUT >	
ID		X	X	ID = name				
SIZE/POSITION		X		X = n Y = n H = n W = n				
DATA TYPE			X	TYPE = datatype	TY = dt			ALPHA, NUMERIC, PASSWORD, AMOUNT, ETC.
MAXIMUM LENGTH			X	MAXLEN = n	MAX = n	NONE		
MINIMUM LENGTH			X	MINLEN = n	MIN = n	0		
TAB ORDER			X	TABORDER = n	TAB = n			
STATUS BAR		X	X					
ID		X	X					
OTHER TBD			X					
FORCED LINE BREAK			X	< BR >				
CENTER			X	< CENTER >	< C >		< /CENTER > OR < /C >	MODIFIES ALIGNMENT
LEFT			X	< LEFT >	< L >		< /L >	MODIFIES ALIGNMENT
RIGHT			X	< RIGHT >	< R >		< /R >	MODIFIES ALIGNMENT
MONEY FORMAT			X	< \$ >			< /\$ >	MODIFIES STYLE
HIGHLIGHT			X	< HL >			< /HL >	MODIFIES STYLE

FIG. 16

FILE HELP									
					05/11/92 12:00EST				
(1) CASH	(2) SAVINGS & INVESTMENTS	(3) BORROWING & LOANS	(4) CREDIT CARDS	(5) SUMMARY & SERVICE	(6) QUOTES	(8) SEE INFO			
					(0) MSGS*	(9) ACTION			

OKAY, PLEASE PRESS THE ONES YOU WANT TO PAY (PRESS AGAIN TO NOT PAY),

(A) YOUR FREQUENT PAYEES

<p>(B) A & S</p> <p>(E) CAR INSURE</p> <p>(H) DINERS CLUB</p> <p>(K) EXXON</p> <p>(N) MACYS</p> <p>(Q) SCHOOL</p> <p>(T) VISA1</p> <p>(W) VISA4</p>	<p>(C) AMEREXP</p> <p>(F) CAR LOAN</p> <p>(I) DOCTOR</p> <p>(L) LILCO</p> <p>(O) MASTERCARD</p> <p>(R) SHELL OIL</p> <p>(U) VISA2</p> <p>(X) VISA5</p>	<p>(D) BLOOMIES</p> <p>(G) CHURCH</p> <p>(J) DRY CLEAN</p> <p>(M) LILCO BUDGET</p> <p>(P) MORTGAGE</p> <p>(S) VISA</p> <p>(V) VISA3</p> <p>(Y) VISA6</p>
---	--	--

PLEASE PRES (+) FOR MORE, OR RETURN WHEN YOU ARE FINISHED (ESC) EXIT

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FIG. 17

FILE HELP

OKAY, WHICH MAY I HELP YOU WITH?

(1) CASH *	(4) CREDIT CARDS
(2) SAVINGS & INVESTMENTS	(5) SUMMARY & SERVICE
(3) BORROWING AND LOANS	(6) CURRENT STOCK QUOTES

(0) MESSAGES (YOU HAVE NEW MAIL)

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DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION
English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **METHOD AND SYSTEM FOR AUTOMATICALLY HARMONIZING ACCESS TO A SOFTWARE APPLICATION PROGRAM VIA DIFFERENT ACCESS DEVICES**; the specification of which (check one)

___ is attached hereto.

X was filed on October 30, 1996 as

X Application Serial No. 08/741,121

___ and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent of inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

(Number)

(Country)

(Day/Month/Year Filed)

☐

☐

Yes

No

(Number)

(Country)

(Day/Month/Year Filed)

☐

☐

Yes

No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

English Language Declaration

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Dale C. Hogue, Sr., Registration No. 32,823; George T. Marcou, Registration No. 33,014; Michael D. Bednarek, Registration No. 32,329; George C. Beck, Registration No. 38,072; Richard Peterson, Registration No. 35,320; and Mike S. Ryu, Registration No. 38,604 (Patent Agent).

Send Correspondence to:

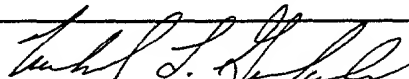
Direct telephone calls to:

Dale Curtis Hogue, Sr.
Kilpatrick & Cody
Suite 800
700 - 13th Street, N.W.
Washington, D.C. 20005

Dale Curtis Hogue, Sr.
(202) 508-5800

Full name of sole or first inventor: Michael L. GRANDCOLAS

Inventor's signature X



X Date

2/4/97

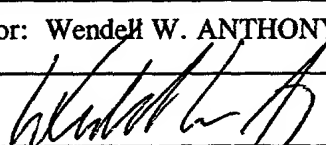
Residence: 247 Ocean Park Boulevard, Santa Monica, California 90405

Citizenship: U.S.A.

Post Office Address: 247 Ocean Park Boulevard, Santa Monica, California 90405

Full name of second joint inventor: Wendell W. ANTHONY

Second Inventor's signature X



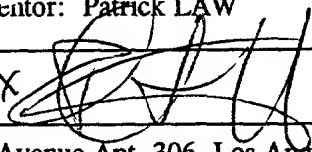

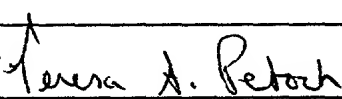
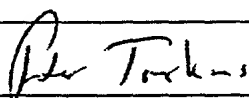
X Date

2/4/97

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Citizenship: U.S.A.

Post Office Address: 152 S. Sepulveda Boulevard Brentwood, California 90049

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Citizenship: U.S.A.	
Post Office Address: 3709 Watseka Avenue, Apt. 306, Los Angeles, California 90034	
Full name of fourth joint inventor: Leslie MOSS	
Fourth Inventor's signature X 	X Date 2/6/97
Residence: 2016 Kelton Avenue, Los Angeles, California 90025	
Citizenship: U.S.A.	
Post Office Address: 2016 Kelton Avenue, Los Angeles, California 90025	
Full name of fifth joint inventor: Teresa A. PETACH	
Fifth Inventor's signature X 	X Date 2-4-97
Residence: 12773 Caswell Avenue, #201, Los Angeles, California 90066	
Citizenship: U.S.A.	
Post Office Address: 12773 Caswell Avenue, #201, Los Angeles, California 90066	
Full name of sixth joint inventor: Peter TOMPKINS	
Sixth Inventor's signature X 	X Date 2/4/97
Residence: 28450 Pacific Coast Highway, Malibu, California 90265	
Citizenship: U.S.A.	
Post Office Address: 28450 Pacific Coast Highway, Malibu, California 90265	

PATENTS ONLY

To the Honorable Commissioner of Patents and Trademarks: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):

Michael L. GRANDCOLAS
Wendell W. ANTHONY
Patrick LAW
Leslie MOSS
Teresa A. PETACH
Peter TOMPKINS

2. Name and address of receiving party(ies):

TRANSACTION TECHNOLOGY, INC.
12731 W. Jefferson Boulevard
Los Angeles, CA 90066

3. Nature of conveyance:

☒ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Other: _____

Execution Date(s): February 4, 1997 and February 6, 1997

4. Application number(s) or patent number(s):

This document is being filed together with a new application:

(a) The execution date(s) of the application is/are:

(b) The title is: METHOD AND SYSTEM FOR AUTOMATICALLY HARMONIZING ACCESS TO A SOFTWARE APPLICATION PROGRAM VIA DIFFERENT ACCESS DEVICES

*** OR ***

This document is being filed after filing of the application:

(a) Patent Application No(s). 08/741,121 filed October 30, 1996; or

(b) Patent No(s). _____, issued _____.

5. Name and address of party to whom correspondence concerning document should be mailed:

KILPATRICK STOCKTON LLP
Suite 800
700 13th Street, N.W.
Washington, D.C. 20005

Our Docket: T0091.094251/GTM

6. Total number of applications and patents involved: 1

7. Total fee (37 CFR 3.41)..... \$ 40.00

☒ Enclosed
☐ Authorized to be charged to deposit account.

8. Deposit Account No.: 11-0855 (Any underpayment is authorized to be charged to this Deposit Account)
(Attach duplicate copy of this page if paying by deposit account)

9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

George T. Marcou, #33,014
Name of Person Signing


Signature

Date: 2/10/97Total number of pages comprising cover sheet: 1

DO NOT USE THIS SPACE

T0091-094251

ASSIGNMENT

WHEREAS, we, Michael L.GRANDCOLAS, Wendell W. ANTHONY, Patrick LAW, Leslie MOSS, Teresa A. PETACH and Peter TOMPKINS, the undersigned, invented the METHOD AND SYSTEM FOR AUTOMATICALLY HARMONIZING ACCESS TO A SOFTWARE APPLICATION PROGRAM VIA DIFFERENT ACCESS DEVICES for which an application for Letters Patent of the United States of America was filed on October 30, 1996 and assigned Serial No. 08/741,121.

WHEREAS, TRANSACTION TECHNOLOGY, INC., a U.S. corporation of Citibank Development Center, 12731 W. Jefferson Boulevard, Los Angeles, California 90066, (hereinafter referred to as the "Assignee"), is desirous of acquiring the entire right, title and interest in and to said invention, and in and to said application and any Letters Patent that may issue thereon;

NOW, THEREFORE, for and in consideration of One Dollar (\$1.00), and other good and valuable consideration, the receipt of which is hereby acknowledged, we, the undersigned, do hereby sell and assign to said Assignee, and to said Assignee's successors and assigns, my entire right title and interest in and to said invention, said application, any and all patents which may be granted therefrom, and any and all extensions thereof; and we authorize and request the Commissioner of Patents and Trademarks to issue any and all patents for said invention, or patents resulting from said application to said Assignee, as assignee of our entire right, title and interest;

We also hereby sell and assign to said Assignee, and to said Assignee's successors and assigns, our foreign rights to the invention disclosed in said application in all patent-granting countries of the world, including the right to file applications and obtain patents for said invention in Assignee's own name in said countries, including all rights of priority under the terms of the International Conventions for the Protection of Industrial Property, and we

We additionally agree to communicate to said to said Assignee or to said Assignee's successors, assigns and legal representatives, any facts known to me respecting any improvements, and agree to, at the expense of said Assignee, to testify in any legal proceedings, sign all lawful papers, execute all divisional, continuation, reissue and substitute applications, make all lawful oaths, and generally do everything possible to aid said Assignee, and said Assignee's successors, assigns and nominees to obtain and endorse proper patent protection for said invention in all countries.

2-4-97
Date

X 2-4-97
Date

X 2-4-97
Date

X 2-6-97
Date

X 2-4-97
Date

X 2/4/97
Date